What is claimed is:

[Claim 1] 1. A voltage control oscillator, for outputting a clock signal with a frequency according to an input voltage, comprising:

a constant current source, for providing a reference current;

a voltage/ current converter, coupled to the constant current source, for determining a first current passing through the voltage/ current converter according to the input voltage;

a current mirror, having a first current terminal and a second current terminal, the first current terminal being coupled to the constant current source, for determining a third current passing through the second current terminal according to the second current passing through the first current terminal, wherein the second current is the reference current subtracted by the first current; and

an oscillating circuit, coupled to the second current terminal of the current mirror, for determining the frequency of the outputted clock signal according to the third current.

[Claim 2] 2. The VCO as recited in claim 1, wherein the oscillating circuit comprises:

a current control oscillator, coupled to the second current terminal of the current mirror, for receiving and determining the frequency according to the third current and outputting a pulse signal having the frequency; and

a wave shaping circuit, coupled to the current control oscillator, for shaping the pulse signal to the clock signal having a specific wave shape.

[Claim 3] 3. The VCO as recited in claim 1, wherein the constant current source has a reference current input terminal and a reference current output terminal, wherein the reference current output terminal is coupled to a ground voltage level, the reference input terminal is coupled to and receives the first current outputted from

the voltage/ current converter and the second current outputted from the first current terminal of the current mirror.

[Claim 4] 4. The VCO as recited in claim 3, wherein the current mirror comprises:

a first P-type transistor, wherein a source of the first P-type transistor is coupled to a system voltage, a gate of the first P-type transistor is coupled to a drain of the first P-type transistor and the reference current input terminal; and
a second P-type transistor, a source of the second P-type transistor is coupled to the system voltage, a gate of the second P-type transistor is coupled to the gate of the first P-type transistor, a drain of the second P-type transistor is coupled to the oscillating circuit.

[Claim 5] 5. The VCO as recited in claim 3, wherein the voltage/ current converter comprises a third P-type transistor, a gate of the third P-type transistor receives the input voltage, a source of the third P-type transistor is coupled to the system voltage, a drain of the third P-type transistor is coupled to the reference current input terminal and outputting the first current.

[Claim 6] 6. The VCO as recited in claim 5, wherein a body of the third P-type transistor is coupled to the source of the third P-type transistor.

[Claim 7] 7. The VCO as recited in claim 5, wherein the voltage/ current converter further comprises a resistor, wherein the resistor is coupled between the system voltage and the source of the third P-type transistor.

[Claim 8] 8. The VCO as recited in claim 7, wherein the voltage/ current converter further comprises an operational amplifier coupled between the input voltage and the gate of the third P-type transistor, wherein a positive terminal of the operational amplifier receives the input voltage, a negative terminal of the operational amplifier is coupled to the source of the third P-type transistor, and

an output terminal of the operational amplifier is coupled to the gate of the third P-type transistor.

[Claim 9] 9. The VCO as recited in claim 3, further comprising a fourth P-type transistor coupled between the first current terminal of the current mirror and the reference current input terminal, wherein a source of the fourth P-type transistor is coupled to the first current terminal of the current mirror, a gate of the fourth P-type transistor is coupled to a drain of the fourth P-type transistor and the reference current input terminal.

[Claim 10] 10. The VCO as recited in claim 1, wherein the constant current source has a reference current input terminal and a reference current output terminal, wherein the reference current input terminal is coupled to the system voltage, the reference current output terminal is coupled to the voltage/ current converter and the first current terminal of the current mirror.

[Claim 11] 11. The VCO as recited in claim 10, wherein the current mirror comprises:

a first N-type transistor, a source of the first N-type transistor is coupled to the ground voltage level, a gate of the first N-type transistor is coupled to a drain of the first N-type transistor and the reference current output terminal; and

a second N-type transistor, a source of the second N-type transistor is coupled to the ground voltage level, a gate of the second N-type transistor is coupled to the gate of the first N-type transistor, and a drain of the second N-type transistor is coupled to the oscillating circuit.

[Claim 12] 12. The VCO as recited in claim 10, wherein the voltage/ current converter comprises a third n-type transistor, a gate of the third n-type transistor is coupled to the input voltage, a source of the third N-type transistor is coupled to the ground voltage level, a drain of the third N-type transistor is coupled to the reference current output terminal for accommodating the first current.

[Claim 13] 13. The VCO as recited in claim 12, wherein the voltage/current converter further comprises a resistor, and the resistor is coupled between the source of the third N-type transistor and the ground voltage level.

[Claim 14] 14. The VCO as recited in claim 13, wherein the voltage/current converter further comprises an operational amplifier coupled between the input voltage and the gate of the third N-type transistor, wherein a positive input terminal of the operational amplifier receives the input voltage, a negative input terminal of the operational amplifier is coupled to the source of the third N-type transistor, an output terminal of the operational amplifier is coupled to the gate of the third N-type transistor.

[Claim 15] 15. The VCO as recited in claim 10, further comprising a fourth N-type transistor coupled between the first current terminal of the current mirror and the reference current output terminal, wherein a source of the fourth N-type transistor is coupled to the first current terminal of the current mirror, a gate of the fourth N-type transistor is coupled to a drain of the fourth N-type transistor and the reference current output terminal.

[Claim 16] 16. The VCO as recited in claim 1, wherein the third current is approximately equal to the second current.